
V. *An account of Books.* I. *Aſtronomiæ Phyſicæ & Geometricæ Elementa. Auctore Davide Gregorio, M. D. Aſtronomiæ Profeſſore Saviliano & R. S. S. Oxoniæ,* 1702. *fol.*

WHat the World has hitherto wanted, the Learned Dr *Gregory*, has ſupplied it with a compleat Syſtem of true and Phyſical Aſtronomy; and as the laſt Ages have been ſufficiently furniſhed by the Ancients, with the Elements of Geometry, ſo without queſtion the future will have recourſe to this Book, for thoſe of Phyſical and Geometrical Aſtronomy.

The Phyſical explications are all built upon the principles of the great Mr *Newton*; and he has, throughout the whole Work, ſo mixed theſe with the Phænomena's themſelves, that they who are only ſollicitous about the Aſtronomical part, may underſtand it, as it is there delivered, without inquiring into the Phyſical cauſes. The Geometrical parts are either all proved from the citations of ſtandard Authors, or demonſtrated in *Lemma*'s, inſerted in their reſpective places. And that the Reader may not think Phyſical Inquiſitions in Aſtronomy to be only new, in his Preface he proves from *Diogenes Laertius*, *Plutarch*, *Stobeus*, *&c.* that the ancient Philoſophers, beſides their knowledge of the true Syſtem of the Univerſe, were not unacquainted with the real and Phyſical cauſes of the Planets Motions, and that univerſal Law of Nature from which they all ſpring, *viz.* that Matter attracts Matter in a reciprocal proportion of the ſquare of the diſtance.

In the firſt Book the Author treats of the Order, Motions and Periods of the Primary Planets, and the chief appearances that ariſe from thence, as their Directions, Stations, Retrogradations, *&c.* the different phaſes of the inferior, like to

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thoſe of the Moon, the Ecclipſes of both Sun and Moon; and then he proves that the Primary Planets turn round the Sun; and that the direction of their gravity is not towards the Earth, but towards the Sun, and that it is by that force of gravity, that they are kept from going out in right lines, and made to turn round in Orbits; that this force of gravity decreaſes in each of them in the ſame proportion, that the ſquare of the diſtance from the Sun or Center encreaſes; as likewiſe, that all the Secundary Planets in turning round their Primary, are kept in their Orbits by the force of gravity, whoſe direction is towards the Centers of their reſpective Primaries, and that the accelerating force of this gravity, is in a reciprocal proportion of the ſquare of the diſtance; and that in the Moon it is the very ſame with the gravity of Bodies towards our Earth. Now, becauſe we know by obſervations, that the Planets move not in Circles, but in Ellipſes; in one of whoſe *foci* the Sun is placed, there muſt neceſſarily be a particular Law of gravity acting towards the Sun, to make the Planet move in ſuch Curves. This he inquires into, and finds it to be the very ſame with what he had before diſcovered, by comparing the diſtances of the Planets from the Sun with their Periodical Times.

Afterwards in the 7th Section, he proves, that this Law of attraction is univerſal of all Matter to Matter, and that it is the very ſame with Gravity; and that the Sun and Planets mutually gravitating towards one another, muſt neceſſarily turn round their common Center of Gravity, which by reaſon of the vaſt bigneſs of the Sun, in reſpect of the reſt, cannot be far from the Suns own Center. Now, ſince by this Law of attraction, the Moon muſt not only be drawn towards the Earth, but alſo towards the Sun; and that differently, according as its diſtance and poſition varies; he from thence, and the inclination of its Orbit to the plain of the Ecliptick, gives us the reaſon why the Nodes move backwards and upon the ſame account, their being as it were a redundant ring of Matter about the Earths Æquator, he ſhows how the Æquinoctial points muſt neceſſarily conſtanly go back a little, and make a proceſſion of the *Æquinox*.

Having thus ſettled the true cauſes of the Cœleſtial Motions, he next enquires into the various opinions of Philoſophers on that ſubject, and examines the *Phyſica Cœleſtis* of *Kepler*, the *Vortices* of *Carteſius*, and thoſe of the ingenious Monſieur *Leibnits*, whoſe ſeveral Theories he ſufficiently confutes; and then he gives an account of the other three celebrated Syſtems of the Univerſe, the *Ptolemaick*, *Tychonick* and *Semi-Tychonick*, and the different forces that are neceſſary to make the Planets move in the order, which thoſe Syſtems require.

In the 2d Book are explained all thoſe things that depend upon the motion of the *Primum Mobile*, the Doctrine of the Sphere, the Geneſis of the Circles, the uſe of the Globes, Spheres and other Inſtruments that are contrived to repreſent the Diurnal Motions of the Stars, together with the method of determining by obſervations the poſitions of the Circles in reſpect of each other, and the places of the Stars, their Longitudes, Latitudes, *&c.* the method of making Catalogues of the fixt Stars, with an Hiſtorical account of all thoſe Catalogues that have been hitherto made. Here alſo he ſhows the way of ſolving all the common problems of the Sphere by Trigonometry, as alſo the foundation and method of making all ſorts of Dyals by the ſame *Calculus*: And laſtly the various Ways of determining the Parallax and Refractions of the Stars with their demonſtrations.

In the 3d Book he deſcends more particularly to the Theory of the Primary Planets. And, becauſe each Planet ſo moves in an Ellipſe round the Sun, that it deſcribes Area's always proportional to the times, he gives the methods of dividing the Area of an Ellipſe by a Line drawn from its *focus* in a given proportion; which may be done either by the indirect method of *Kepler*, or directly by a Series of his own, which he demonſtrates; and then he ſhows Dr *Ward*'s Theory (wherein the Planets are ſuppoſed to deſcribe about the other *focus angles* always proportional to the times) to be only an approximation to the true one, wherein they deſcribe Area's at the other *focus* that are proportional to the times, and as ſuch it is expreſly mentioned by *Kepler* in his *Epitome Aſtronomiæ Copernicanæ*; but if the diſtance between the *foci* be great, this method will not give the exact place of the Planet, and therefore it wants the approximation of *Bullialdus*, which is only a nearer approach to truth Here alſo he conſiders the Oval Figure, in which Monſieur *Caſſini* ſuppoſes the Planets to move; and he proves, that if a Planet moved in that Curve according to M. *Caſſini's* Theory, it would deſcribe round the Sun equal Areas in equal times; and by conſequence a Centripetal force of a determined kind acting upon the Planet, might make it deſcribe this Curve; whereas Dr *Ward's* Theory is Phyſically impoſſible, there being no Centripetal force towards the Sun, that can make them move in an Ellipſe according to this Law; but then he tells us, that the Theory of *Caſſini* does not anſwer obſervations, nor will give the true Anomaly of the Planet, and its diſtance from the Sun. After this he comes particularly to ſhew the methods of determining the Orbits of the Earth and Planets, their Excentricities, poſition of their Apſides and Nodes, and deſcribes all the Tables that are neceſſary to calculate their motions, together with the manner of making them; and he alſo ſhews the way of finding out the Magnitudes, Denſities and Figures of the Sun and Planets, and the diſtances of the fixt Stars, where he takes notice, that the annual different diſtances of a fixt Star from the Pole (which Mr *Flamſteed* in his Letter to Dr *Wallis*, Printed in the third Tome of the Drs Works, ſays, he has obſerved in the Polar Star) does not neceſſarily ariſe from their Parallax; but may proceed from other cauſes, ſo that from this obſervation, we cannot conclude the parallax of the fixed Stars, nor does it directly prove the motion of the Earth, which Mr *Flamſteed* thinks he has done by it. And it is the more likely, that this variation of the Stars diſtance from the Pole, obſerved by Mr *Flamſteed*, proceeds from ſome nutation, ſince the young

Mr *Caſſini* has demonſtrated, that in the Polar Star it cannot ariſe from the parallax of the *Magnus Orbis*; and our Author has given us good arguments to prove the fixt Stars to be at ſo great a diſtance, that the Diameter of the *Magnus Orbis* is inſenſible in reſpect of it.

Having thus eſtabliſhed the Theory of the Primary Planets, in the 4th Book he gives us that of the Secundary, whoſe motions are much more compoſed and intricate than any of the firſt, theirs being only compounded of an uniform progreſſive motion forward, and that of Gravity, by which, as it were they are drawn toward the Sun; whereas the Secundaries are not only attracted towards their reſpective Primaries; but alſo towards the Sun, and that with the ſame accelerating force of Gravity as the Primaries, when at the ſame diſtance, with a greater force when nearer, and a leſſer when further from the Sun, than the Primaries are. Which variety of the force of attraction, according to the various poſitions of the Secundaries Orbit, its inclination to the Orbit of its Primary, and the place of the Secundary in this Orbit, muſt neceſſarily produce various inequalities and irregularities in the motions of the Secundaries, all which he conſiders, at large, and from thence he explains the motions of the Apſides forwards, that of their Nodes backwards, the changeable inclination of the Orbits to the plains of their Primaries Orbits, the different velocities of the Secundaries, according as their poſition in reſpect of the Sun, and their Primaries vary; and he applys the whole to the motions of the Moon. All this, before the happy diſcoveries of that celebrated Philoſopher Mr *Newton*, was not to be attempted by any Phyſical explication, the greateſt advancement that was made, being only to ſolve them by an Aſtronomical Hypotheſis. He alſo gives us an account of the Tables neceſſary to calculate the Moons place ſeen out of the Earth, and the manner of uſing them; and to this he joyns Mr *Newton's* own Theory of the Moon, which if uſed in practice, will determine her place nicely enough, even in the Quadratures, as has been found by comparing it with Mr *Flamſteed's* obſervations, where when the

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error is greateſt it exceeds not two minutes, but for the moſt part it is ſo ſmall, that it may be juſtly enough imputed to the uncertainty of obſervations. After this he treats more particularly of the Eclipſes of both Sun and Moon, and the manner of Calculating them; he gives an account of the Moons motion round its Axis, and ſhows how all thoſe various nutations and librations of the Moon, that has hitherto ſo much puzzled the Philoſophers, do only ariſe from its Menſtruous uniform rotations round its Axis; from thence he paſſes to the ways of determining the magnitudes, denſities, and quantities of matter in the Secundary Planets, and the change of Figure both in the Primaries and them, that muſt neceſſarily ariſe if they are fluid from their mutual gravitation towards one another, from which he explains the Tydes and Motion of the Seas. He ends the Book with a deſcription of the Ring of *Saturn*, and accounts for all its various appearances ſeen out of the Earth.

In the 5th Book the Author treats of Comets, where after having given the ſeveral opinions of Philoſophers about their Place, Duration, Origine, Orbits and Tayls; he tells us, that certainly they are Bodies that move round the Sun, and differ from the other Planets in that their Orbits are very oblong Ellipſes, whereas the Planets deſcribe Ellipſes which come very near to Circles, and from this Hypotheſis it is eaſy to give an account of the moſt of their *Phænomena*; particularly he ſhows, that when a Comet comes down from its *Aphelion*, or when it aſcends to it, its Trajectory will ſeem to be a right Line, and may be aſſumed as ſuch, when its motions are to be determined without great niceneſs; and upon this account, it is that *Kepler* and ſeveral others of the Aſtronomers did really ſuppoſe, that they went on ſtill in ſtreight Lines, without ever returning. Their Tayls he takes to be Vapours, which being heated by the Sun, ariſe copiouſly from their Bodies when they deſcend towards it, and are carried upwards by the Air in which they ſwim where he takes notice, that if this matter of the Tail (which is ſpread at a great diſtance from the Comet itſelf) ſhould touch and mix with our Atmoſphere, may infect it with qualities pernicious to the temperament of our Vegetables and Animals; and from thence may ariſe all thoſe effects, which by long obſervations and common conſent of Mankind, have been attributed to Comets, notwithſtanding of their being ridiculed by ſome Modern Philoſophers. From this he paſſes to ſhow the method by which the Orbits of the Comets are to be determined. The ways he takes, are not only excellent in that caſe, but likewiſe of great uſe in ſolving other intricate and difficult Problems in Natural Philoſophy. And then he gives the way of finding both the Heliocentrick and Geocentrick places of a Comet for any given time, and deſcribes Tables that are neceſſary for the more ready performance of it.

The 6th and laſt Book is upon comparative Aſtronomy where he conſiders the *Phænomena* that would appear to a, Spectator placed in each of the Heavenly Bodies, and compares them with thoſe that are ſeen from the Earth. The chief of thoſe he takes notice of are their viciſſitude and duration of Days and Nights, the apparent Bigneſs, intenſneſs of Heat, and light of the Sun, the length of their Years, and variety of Seaſons, the phaſes of the Moon, and the Eclipſes of the Luminaries, the Number, Directions, Stations and Retrogradations of the Planets that are to be ſeen, and the helps they may afford to diſcover the true Syſtem of the Univerſe. After having given us an account of all theſe appearances in each of the Heavenly Bodies, he ſhows us that of all the Primary Planets, the Earth is the fitteſt place where an obſerver may diſcover the true Syſtem of the World, and *Mercury* the moſt unfit for that purpoſe; and that therefore an Inhabitant in any one of the Planets, may upon better reaſons ſuppoſe his own Habitation immoveable, and that the whole Heavens turn round about him; then theſe which our Terreſtrial obſervers have for their immobility, and having fewer arguments, it will be harder to convince them of their own motion. We may reaſonably then imagine, that an Aſtronome in any of the other Planets; as for example in *Venus*, would ſuppoſe his own Habitation immoveable, and would

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endeavour to make a Syſtem to ſatisfy all *Phænomena's* upon that Scheme. This in his propoſition of the Aſtronomy in *Venus*, he ſays may be affected from the true Syſtem two ways: Firſt, if *Venus* were brought from its place in the true Syſtem down to the Center, and the Sun and the reſt of the Planets together with their Orbits, advanced as far the ſame way in parallel Lines, Such a Syſtem in *Venus* would be perfectly *Tychonick*, in which the Sun would be made turn round *Venus* in an Orbit equal, and like to that, in which *Venus* does really turn round the Sun, in the true Syſtem, and all the Planets, together with their Satellites, beſides their being carried round *Venus* by the Sun, would have all the ſame motions round the Sun, as in the true Syſtem. The Orbit of the Earth in this Syſtem, would cut the Sphere of the Sun after the ſame manner, as in the *Mars* interſects the Orbit of the Sun in the *Tychonick* Syſtem, which is framed for our Earth, whereas the Orbit *Jupiter* would not cut it, but ſurround it. The ſecond way, by whichd an Aſtronomer in *Venuus* may contrive a Syſtem to ſatisfy appearances, and make himelf unmntovable in the Center, is by bringing *Venus* to the Center, and advancing th Sun and all the Planets juſt as far in parallel Lines, as wa done before; but leaving their Orbits immoveable, and th very ſame which the Planets deſcribed round the Sun in th true Syſtem. If this were ſuppoſed by an Aſtronomer in *Venus* it would be the *Ptolemaick* Syſtem, in which the Sun is carri ed round *Venus*, placed in the Center of all the Planets Orbits, and ſuch of the Planets move in an Epicicle ſimular and equal, but in a contrary poſition to the true Orbit of *Venus* round the Sun, the Centers of the Epicicles being moved in their deferents in the ſame times that the Planets themſelves perform their revolutions in the true Syſtem. And a *Ptolemaick* Syſtem made in this manner, would ſatisfy all the Cœleſtial *Phenomena's* equally as well as the *Tychonick* or the true Syſtem; ſo that if the *Ptolemaick* Syſtem for the Earth had been thus framed, there could have been no arguments from ob-

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ſervations brought againſt it; nor indeed any other way left to convince it of falſhood, but that only which is drawn from the principles of Natural Philoſophy.

II. *An Abſtract of Dr* Mead's *Mechanical Account of Poyſons ſent to the Publiſher, by* Sam. Morland.

THe firſt Eſſay with which the Dr preſents us, is concerning the *Viper* and its Poiſon. His Enquiries were the more neceſſary here, becauſe the Ancients, as he informs us, terrified both by Superſtition, and the danger of ſuch Experiments, have left the Anatomy of theſe Creatures very imperfect, and conſequently have reaſoned both looſely and precariouſly about the nature and effects of its Venome. *Charas*, *Rhedi* and Dr *Tyſon* have made great advances in this matter; but 'tis upon a yet more accurate account of the Structure and Configuration of all thoſe parts that prepare, contain and diſcharge the deadly Juice that the Dr founds his enſuing reaſonings. (Which account you have with the neceſſary Figures, as drawn up by that Incomparable Anatomiſt and Learned Phyſician, Dr *Areskin* at the end of the firſt Eſſay.)

The Dr makes no ſcruple to aſſert, that the Viper conveys its miſchief by the yellow Liquor, which it emits into the Wound, thro a ſlit near the extremity of the Tooth. He hath here decided the controverſy ſo long agitated between Mr *Rhedi* and *Charas* in favour of the former, by ſeveral ſo convincing experiments, as that he hath left no room for future doubt or Cavil, making it even plain, that the *Sanies* itſelf conveyed into a Wound made by inciſions, and not by the Vipers Teeth, if it be infuſed in a ſufficient quantity will not

not fail to kill. Tho it may not have the operation, when infuſed by an hand too ſparing and timerous of ſucceſs.

That the Creature is furniſhed with ſo fatal a Juice, was deſigned for its own ſubſiſtence. Its food being ſuch as it could never digeſt, unleſs it immediately killed its Prey. That it hurts any beſides, is only by accident, and when they meet it in its angry mood.

Upon the diſcharging this *Juice* into the Wound, there follow Pains, Swellings firſt red and then livid; Faintings, Vomitings, cold Sweats, a change of colour in the Skin, like as in the Jaundice and finally Death, unleſs the ſtrength of the Patient, or ſeaſonable Medicines prevent.

To account for theſe *Symptoms*, the Dr thought neceſſary to examine the Texture of this Juice, which by viewing it thro an admirable Microſcope, he found to be full of little floating Salts, which in a ſhort time ſhot out themſelves into *Cryſtals* of an incredible tenuity and ſharpneſs, of which whole appearance he hath given a delineation in the Table. With this Juice he made ſeveral other experiments, upon the credit of which he blames thoſe that boldly, and without due enquiry affirm, that it is *Alkalious*, that ſo they may ſubject a new ſet of Maladies to the juriſdiction of their admired never failing *Acids*.

It was neceſſary not only to conſider this Juice, but the *Blood* alſo into which it is conveyed. And therefore the Dr gives us an account of the Doctrine of Fluids, the different coheſions and directions of their Particles upon Mr *Newton*'s Principles: Adding what is remarkable in the Blood, which is the Fluid under conſideration. Now this conſiſting of innumerable *Globule*'s floating in a Limpid *Serum*. The pointed Salts before-mentioned, are conjectured by the Dr to prick thoſe Globules or little Bladders. Whoſe hulls or caſes thus emptied of their Contents adhere, and are attracted in a manner quite different from what they were before, and ſo ſerve to break the Texture of the remaining Blood. Eſpecially, if we conſider, that the *Aura* theſe Veſiculæ emit may ſerve both to drive and convey the *Viperine Spicula* till they have diffuſed their ill effects over the whole Maſs. And thus I have given you an hint of the Drs reaſoning about this abſtruſe Matter. To which I ſhall only add, that the Dr omits not to acquaint his Reader, that he is of opinion, that theſe *Spicula* act upon the ſenſible Membranes in the nature of *Stimuli*, which he explains upon *Bellinis* Principles.

For the Cure he mentions a red hot Iron apply'd to the Wound, the Snake Stones, the *Axungia Viperina*, which he proves to be the grand Secret of the Viper Catchers; and the Vipers Fleſh of uſe the of which he gives a curious account out of the Ancient Phyſicians and Modern Travels.

In the cloſe of this Eſſay he gives an account of ſome other *Poyſonous* Animals; as the Spider, in which he hath diſcovered the Inſtrument conveying the Poyſon, which had eſcaped the nice diligence of Mr *Leewenhoek* himſelf; the *Scolopendra*; the *Scorpion*, of which I ſhall particularize nothing but that when it is reduced to a deſpair of Life, it wounds itſelf with its own Sting on the Back and dyes. And that the *Oleum Scorpionum* is a preſent Remedy for their Stings.

The next Eſſay is of the *Tarantula* and *Mad Dog*. The *Tarantula* is an *Apulian Spider* of the *Octonocular* kind, the Figure of which may be ſeen in *Baglivi*'s Diſſertation. To which there is one very like deſcribed by *Hernandez* by the name of *Hoitztocatl*. It harbours among the Corn and there bites Mowers or Paſſengers. Upon which bite, eſpecially in Summer Time very odd Symptoms enſue, which require as odd a Cure. For among other effects, which ſavour of a *Delirium*, of which the Drs gives a particular enumeration, it is very obſervable, that when the *Tarantati* lye as ſometimes they do like Apoplectick Perſons, upon the ſound of an appropriate Tune they riſe up, and Dance till they ſweat out the Malady. Which yet returns tho in a weaker Degree, the ſame Seaſon the next year, and then again yields to the ſame method of Cure. Moſt of the Symptoms which

pehpreceed the Apoplectick State, out of which the Muſick raiſes the perſon afflicted, having a tang of Madneſs, gives the Dr occaſion to preſent us with ſome curious and uncommon Thoughts about a *Delirium*; and to ſhow how theſe changes which are introduced into the Blood by the bite of the Spider, do diſpoſe the perſons to ſuch Actions, as denominate a Man in common Speech delirous. That his Account about theſe alterations in the Blood is true, appears plain, from what *Baglivi* obſerved in a Rabbit bitten by the *Tarantula*. But the moſt ingenious part of this Eſſay is that, wherein he ſhews, how Muſick may be ſuppoſed to contribute to the Relief of thoſe who are thus afflicted. As it works upon the mind, by preſenting to it lively *Species* of Joy and Mirth. As it affects the Body not only by exciting to thoſe motions that help them by Sweat and Evacuations, but as the harmonically Vibrating Air, by immediate contact affects the contractile Membranes with ſuch a determinate force, eſpecially thoſe of the Ear, and thereby of the Brain, which aſſiſts the contraction of the Fibrils, prevents a beginning Coagulation, *&c.* Upon which occaſion, we meet toward the end of this Eſſay with a moſt entertaining account of the ſeveral occaſions, upon which the Antients called in the aſſiſtance of Muſick for healing Diſtempers. This method being uſed by *Æſculapius*, *Theophraſtus*, *Cælius Aurelianus*, *Thales* of *Crete*; as the Dr proves from *Galen*, *Pindar*, *Athenæus*, *Aulus Gellius* and *Plutarch*. Where there are two remarks too particular to be omitted, one is, that this practice is called *Decantare loca Dolentia*, which is a lucky atteſtation to one part of the Dr's foregoing reaſoning. The other, is, that *Pythagoras* himſelf, who reſided in this part of *Italy* may not improbably be ſuppoſed to have introduced this method in this Caſe.

The Symptoms from the bite of a mad Dog are no leſs odd, but much more terrifying. Of theſe Symptoms the Dr hath given us an account, as they have been obſerved by *Galen*, *Dioſcorides*, *Ætius*, *Ægineta* and *Cælius Aurelia-*

nus; as alſo from Dr *Liſter* and Dr *Howman*. As for the moſt of theſe Symptoms which the Dr with the generality of Authors attributes to a *Delirium*, He accounts for them by the alteration made in the Blood by the *Saliva* of the Dog, whoſe Madneſs he ſaith, is the effect of an high Feaver. This incorporated with the Arterial Fluid raiſes an efferveſcence in the Blood Veſſels, eſpecially in the Brain, from whence proceed ſuch diſorders, as may eaſily be ſuppoſed to induce a *Delirium* according to the account of this affection given in the former part of the Eſſays. As to the *Hydrophobia*, the Dr hath advanced a notion, which, however particular it may ſeem, will I dare ſay, become general in a ſhort time. For he ſuppoſes this to be no part of the *Delirium*, but to ariſe from the Pain they feel in ſwallowing Liquor, which Pain is excited, partly by its touching the inflamed Membranes of the *Fauces*, partly becauſe the Liquor fermenting with the active Particles diſcharged upon the Stomachick Glands twitches and irritates the Membranes. A like inſtance, to which we have in Colical Caſes. But nothing can go farther towards deciding the Caſe, than to know, as he affirms that upon whatever occaſion the Glands, become thus inflamed the *Hydrophobia* follows, tho there be no Bite in the caſe. Which he proves from *Sckenckius*, *Salmuth*, *&c.* and obſervations from diſſections.

For the Cure he recommends beſides enlarging the Wound, Scarrifying, or at leaſt pouing in melted *Unguentum Ægyptiacum*, all that abſorbs a Peccant Humour, or carries it off by Urine. Several Medicines to this purpoſe he mentions, and among the reſt *Lichen Cinereus Terreſtris*, whoſe Efficacy depends upon the aforeſaid properties. But above all ſubmerging, of which he gives a brief Hiſtory, and a Philoſophical account of its operation and ſucceſs.

Eſſay the 3d, is of Mineral and Vegetative Poyſons. *Sublimate* is compounded of *Mercury* and *Common Salt*, which when ſublimed, prove one of the moſt deadly Poyſons, tho each

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compounding Ingredient be perfectly innocent. Of the latter there is no doubt, the innocency of the former he proves by ſeveral inſtances, and the Nature of its operations as a Medicine, in which he declares himſelf to agree with the Learned Author of the new Theory of Fevers, to whom he refers for a farther account of this matter. The compoſition becomes deſtructive, as he moſt ingeniouſly informs us, in that the Globules of Mercury which riſe in Fume, lodge themſelves in the Pores, and Inſterſtices of the Saline Cryſtals. Now theſe being like ſo many ſharp Blades wound more forcibly by the addition of this weight of the Mercurial Globules, and more conſtantly and irreſiſtably, becauſe the Inſterſtices, at which the Stomachick Juices would otherwiſe enter and diſſolve theſe wounding Salts, are already poſſeſſed by the Particles of Mercury. This account will be the more acceptable to thoſe that read on, till they ſee how in purſuance of the ſame principles the Doctor explains (what ſeems hitherto to have been in vain attempted) the deſtruction of this corroſive Quality by a ſecond Sublimation.

Next he fetches the Nature of *Arſenick* out of the darkneſs and obſcurity, in which it hath lain till now. And here after an accurate Enumeration of the ſeveral kinds both Native and Factitious, having examined upon Chymical Principles its Compoſition, he accounts for its operation much after the ſame manner, as for *Sublimate Corroſive*: There being here alſo cutting Salts and a *Rugalus* to give them weights and force. Only it is to be obſerved, that the *Sulphur* diſcoverable in *Arſenick* both by ſmell and its inflammability, ſerve as an additional *Vinculum* to the wounding *Spicula*, and by its heat to inflame the Wounds which they have made. He concludes this Eſſay with wonder at a dangerous cuſtom that hath prevailed among ſome to wear a bag of this Corroſive Mineral at the pit of the Stomach, as an Amulet againſt the Plague. Into which he moſt probably conjectures men were lead, by ſome ignorant Writers who falſly Tranſlated *Darſini* (which ſignifies Cinnamon, and is recommended by *Arabian*

bian Authors as a preſervative) by *Arſenick*, which in *Arabick* is called *Zarnick*.

As for Plants as *Cicuta*, *Aconitum*, *OEnanthe Cicutæ facie ſucco Viroſo*, *&c.* he imputes their deadly effects to their Corroſive parts, which rarifying the Juices of the Stomach, and wounding it, Nervous Membrane by an eaſy and intelligible proceſs, induce all thoſe diſorders which at laſt end in death. For beginning their Havock in the Stomach, they draw all parts by degrees into a communication of Pains and Agony.

Here he makes it plain how Mineral and Vegetative Poyſons tho of the ſame kind, work ſo differently from their different force. And how, tho Mineral Poyſons ſeldom paſs the *Primæ Viâ*, yet Vegetables often do. This Eſſay concludes with an ingenious conjecture at the compoſitions of thoſe Poyſons, by which the *Africans* and *Indians* are reported to be able to kill at long diſtances of time, and ſome directions about the Cure.

Eſſay 4. *Opium* he tells us comes under the Head of Narcotic Poyſons, tho a noble Remedy exhibited in a proper quantity. To aſſiſt our conceptions about the Nature of this, he explains the Nature of *Sleep* at large, of which I ſhall only rehearſe thus much, that as it concerns the Body, it conſiſts in an eaſy, and a ſort of Æquilibrious diſpoſition of the Fluids, and Muſcular parts. As to the Mind, in a ceſſation of ſuch thoughts as we exerciſe when awake, upon which we reflect, and will to employ our Minds.

After this and a Chymical Analyſis of *Opium* itſelf, he aſcribes its efficacy to a *Volatile*, *Alcaline Salt* intimately mixt with a Sulphurous ſubſtance, which he proves at large to act upon the Stomach and the Arterial Fluid itſelf, and diſpoſe in ſuch a manner as it is diſpoſed when we Sleep. He ſhows further how by the ſame Mechaniſm this Drug eaſeth Pains, checks Evacuations, cauſes difficulty of Breathing; but above all, how in too great a quantity it commenceth Poyſon by rarifying the Blood, and enflaming the Stomach to ſuch a degree, that the Veſſels can no more recover their tone, which he found to be exactly the caſe in a Dog, upon which he made the Experiment. For the Cure he recommends Acid Medicines and Lixivial Salts. Generous Wines (the Antients Remedy) help only by diſſolving the clammy Reſinous parts.

The laſt Eſſay is of *Venomous Steems* and *Damps*, in *Latin* called *Mephites*, from a Syriac Theme ſignifying to breath. Of this ſort the *Mephitis* of *Hierapolis*, and the *Specus Coricius* were famous of old. They are frequent in Countries that abound with Minerals or Subterraneous Fires. The moſt celebrated of all, is the *Grotta de Cani* near *Naples* in *Italy*, which the Dr hath viſited, and given an accurate deſcription of it. The Fumes which here ariſe but to a determinate height and then turn downwards, and fall back to the Earth, being drawn into the Lungs, both expell the Air out of the *Veſiculæ* and poſſeſſing its room, ſtreighten the paſſage of the Blood Veſſels. How this comes to be ſo deſtructive will appear to them, who ſhall attentively read the Theory of Reſpiration here inſerted, and founded upon Mechanical Principles. He proceeds from hence to treat of Peſtilential Fevers, what conſtitution or temperament of Air inclines to them, how the Symptoms appear in their firſt Riſe, Progreſs and Height, concluding with ſome cautions about *Waters*, which as they are ſometimes ſaturated with Metalline, Lapideous or Saline Particles, produce ill conſequences in the Bodies of Men, different according to the ſtrength of the Tinctures, or the particular nature of the Particles, or the part of the Body wherein they are depoſited.

That the Reader may have a juſt Idea of this performance, I think it neceſſary to add to what hath been ſaid in the extract. That the curious Antient and Polite Learning, with which it is well-ſtored, is the ſmalleſt part of its recommendation. And 'tis not doubted, but the Publick when they have pleaſed and benefitted themſelves by peruſing theſe Eſſays, will agree with me, that their Learned Author was modeſt, when he ſaid that it was not difficult to ſay ſomething on theſe Heads, more tolerable than Authors had before ſaid.

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